## (19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 27 January 2005 (27.01.2005)

PCT

## (10) International Publication Number WO 2005/007939 A1

(51) International Patent Classification7: 29/40, 29/42

C30B 11/00,

(21) International Application Number: PCT/JP2004/010555

(22) International Filing Date:

16 July 2004 (16.07.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2003-275987 60/489,494

17 July 2003 (17.07.2003) 24 July 2003 (24.07.2003)

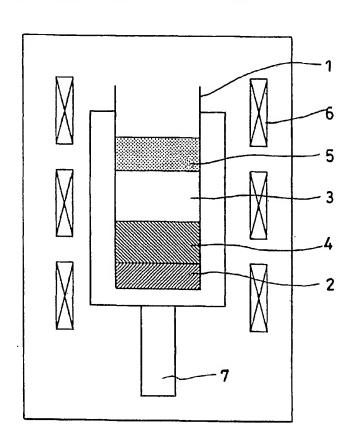
(71) Applicant (for all designated States except US): SHOWA DENKO K.K. [JP/JP]; 13-9, Shiba Daimon 1-chome, Minato-ku, Tokyo 105-8518 (JP).

(72) Inventor; and

- (75) Inventor/Applicant (for US only): MATSUMOTO, Fumlo [JP/JP]; c/o SHOWA DENKO K.K., 1505, Shimokagemori, Chichibu-shi, Saitama 369-1871 (JP).
- (74) Agents: FUKUDA, Kenzo et al.; Kashiwaya Building, 6-13, Nishishinbashi 1-chome, Minato-ku, Tokyo 105-0003 (ЈР).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: InP SINGLE CRYSTAL, GaAs SINGLE CRYSTAL, AND METHOD FOR PRODUCTION THEREOF



(57) Abstract: A method for the production of an InP single crystal includes gradually cooling a molten raw material held in contact with a seed crystal to solidify the molten raw material from a lower part toward an upper part of an inïerior of a crucible and grow a single crystal, causing the seed crystal to possess an average dislocation density of less than 10000/cm<sup>2</sup> and assume substantially identical cross-sectional shape and size with a crosssectional shape and size of a single crystal to be grown, and allowing the InP single crystal to be grown to retain a non-doped state or a state doped with Fe or Sn.



## WO 2005/007939 A1



GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

## Published:

- with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.